specialised undertaking in which all pertinent attributes of the systems and of the products themselves must be considered.

Remarks:

In the last few years several LCI or LCA studies have been conducted assessing the total environmental impact of builder systems, from cradle-to-factory-gate or final disposal (Phosphate report, 1994 and others). Since it is very difficult or missleading to compare inventory data from different studies without knowing and understanding fully the main issues under which an LCI has been performed, the process of comparing and critically reviewing two of the actual Zeolite LCI reports was carried out in a subsequent extension of the study. The purpose of the comparative study was to identify the main differences between the Landbank Phosphate Report, which also published LCI "data" for zeolite, and the present EMPA Zeolite A LCI study. It has focused on the inventory procedure of both exercises and therefore included neither the impact assessment step nor a critical review of the equivalent washing performances of the sodium tripolyphosphate (STPP) versus the Zeolite A - polycarboxylate (PCA) builder system.

The main differences between the two studies were found to be:

- Product form
  The two LCIs are based on different product forms. The EMPA-study specifies the output material as 1 t anhydrous Zeolite A dried at 800°C. The Zeolite A in the Landbank-Report is not clearly specified but from the input materials it is assumed that it must be hydrated and therefore contains 20% water.
- Precombustion energy
  Following SETAC and ISO recommendations it is necessary that the investigated system includes all operations involved in generating and converting energy (precombustion). This has not been included in the Landbank-Report. This is rather surprising for an LCI carried out in 1994 especially because other studies have shown that precombustion can contribute up to 35% of the total energy flow of a process or a whole system. It must be recognised that precombustion energy has been excluded for all the systems reported by Landbank and must be stated anytime these data are compared with other LCIs.
- Data sources
  The data for Zeolite A in the studies are from different sources. Those for STPP were obtained directly from the manufacturing process but those for Zeolite and PCA were taken from the technical literature and patents. The sources are thus inconsistent in terms of quality, age and geography and are therefore disparate.

There is obviously a need for further clarification of the Landbank methodology and data sources. Therefore any quotation or comparison of the Landbank-data with any other LCIs needs a careful and transparent interpretation.

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CML Report

Application of LCA to Agricultural Products

The *Centre of Environmental Science Leiden University (CML)* published the report "Application of LCA to Agricultural Products":
1. Core Methodological Issues
2. Supplement to the LCA Guide
3. Methodological Background.

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This report, translated from Dutch, aims at giving a methodological basis for the application of LCA to both plant and animal products. Specific problems are discussed, and practical solutions suggested. Subjects include the choice of a functional unit for foodstuffs, the boundary between economy and environment in relation to soil, the environmental relevance of capital goods in agriculture, quantification of mineral flows by using a mineral balance, quantification of dessication, and allocation in relation to manure recycling and crop rotation, *inter alia*.

The report may be ordered through the library of CML, phone: +31 71 5277485, fax: +31 71 5275587, postal address: P.O. Box 9518, 2300 RA Leiden, The Netherlands. Please indicate the report number: 130. Costs are Dfl 50, excluding mailing costs.